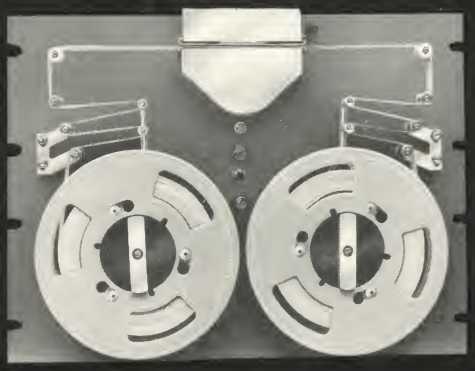
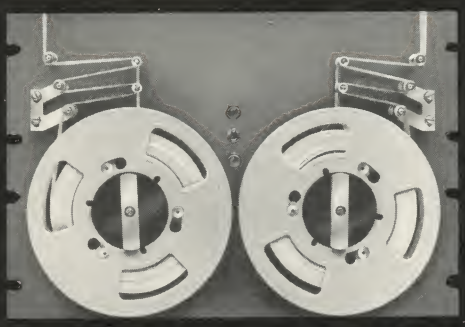
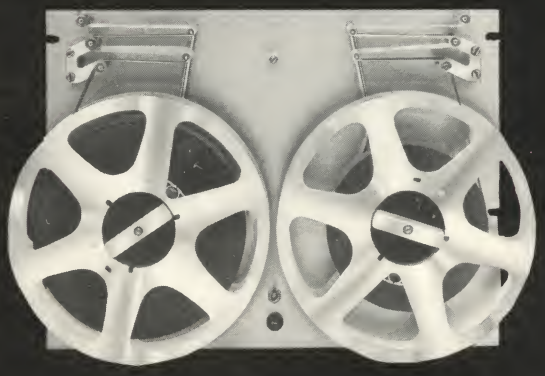
Photocircuits

500 SERIES

TAPE READERS AND SPOOLERS



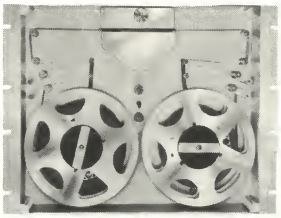




500 SERIES TAPE

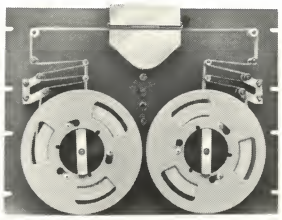
The 500 Series tape readers and spoolers are a family of equipment which are different configurations of one basic unit — the 500R. Standard models in the 500 Series include:

500R



High speed reader and spooler combination, recessed mounted. Printed motor direct capstan drive, bi-directional reading and winding, 8 inch reels with proportional reel servo system.

500RF

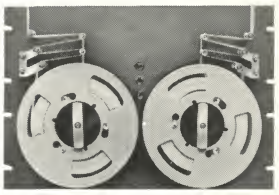


Identical to the 500R except that the reader and spooler are flush mounted rather than recessed.

500T

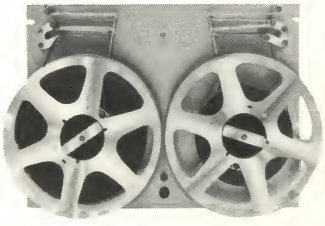
High speed reader identical to that of the 500R but less the reel servo system. Printed motor direct capstan drive, bi-directional.

500S-8



High speed tape spooler utilizing printed motors and a proportional reel servo. 8 inch reels.

500S-10



Identical to the 500S-8 except provided with 10½ inch reels for greater tape storage.

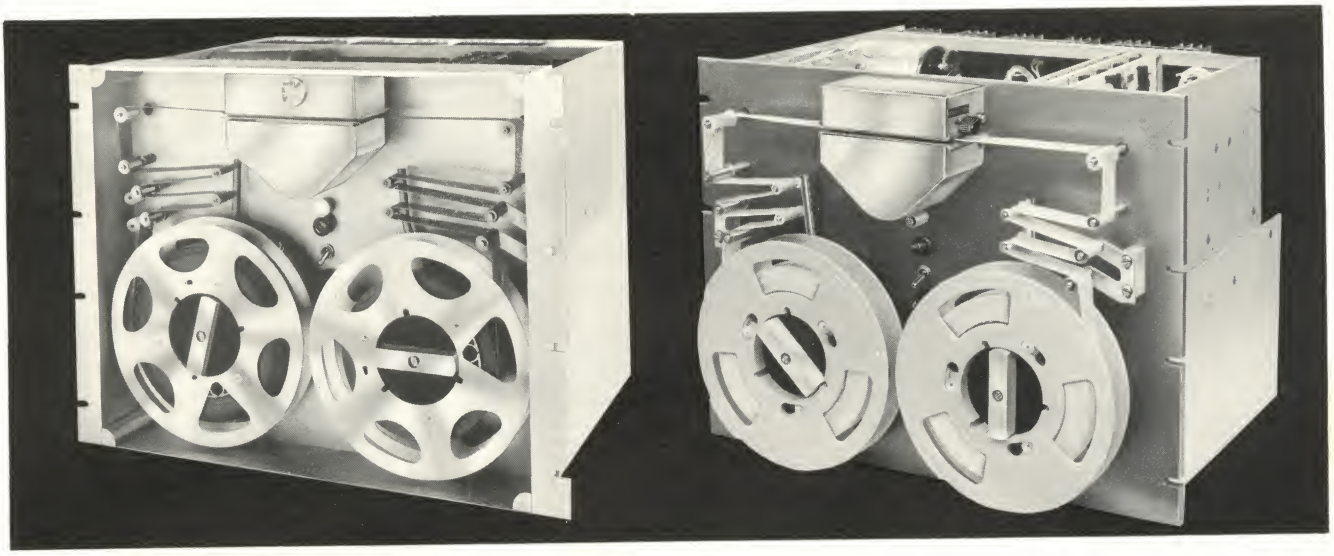
READERS and SPOOLERS

In the 500R, 500RF and 500T, tape movement through the read head is by means of a direct drive capstan utilizing a PMI printed motor. No pinch rollers, friction brakes, clutches or solenoids are used and no adjustments are required. The tape is held against a capstan which is connected directly to the shaft of a printed motor. Tape movement is in exact accordance with the rotation of the motor armature. The unusually high speed of response of the printed motor allows a great variety of reading operations by merely controlling the current applied to the motor terminals. In asynchronous (line-by-line) reading, the motor advances the tape to the next character on receipt of an advance command from the external equipment. The stop pulse is generated internally by the appearance of the sprocket hole of the next character in the read head. The asynchronous reading speed can be any required frequency from 0 to 200 characters per second; the only adjustment necessary is to vary the frequency of the advance command pulses to the desired rate.

The reading speed in the free-running (constant speed, not stopping at each character) mode may be set at any level from 100 to 500 characters per second by a screwdriver adjustment. Tape movement is initiated by a start command from the external equipment. The stop pulse may be obtained from the tape or from an external source. On receipt of a stop command, the capstan will halt the tape before the next character. Tape movement is stopped by current applied to the motor only; no brakes, clutches, solenoids or other mechanical devices are used.

The 500R, 500S-8 and 500S-10 all incorporate a proportional reel servo control in conjunction with printed circuit reel motors to handle tape. The speed of the reel motors is varied to meet the requirements of the capstan. Full servo control is maintained at any speed up to 1000 characters (100″) per second. The use of a proportional reel servo rather than the usual ON-OFF control reduces the possibility of tape damage or breakage and gives quieter, more reliable tape handling.

The mechanical simplicity of the printed motor capstan drive and proportional reel servo system results in a minimum number of moving parts. No adjustments are necessary, maintenance is greatly reduced and accurate readout over long periods of time can be expected. The most recent life test on a Photocircuits tape reader resulted in over 15,000 hours of continuous asynchronous operation at maximum speed without a misread. The service life of all units in the 500 Series is anticipated to be a minimum of 10,000 hours.



MODEL 500R & 500RF SPECIFICATIONS

READING SPEED:
0 to 200 characters per second in the asynchronous (line-by-line) mode. Speed varies with the frequency of the start commands.

Up to 500 characters per second in the free-running (constant speed) mode. Reading speed may be set by a screwdriver adjustment at any required level between 100 and 500 characters per second.

1000 characters per second nominal in the Wind/Search mode.

READER OPERATION:
Bi-directional in all modes. All functions remotely controlled.

START TIME:
3.5 milliseconds after start command to reach the next character.

STOP DISTANCE:
On stop character (.046″) at 200 characters per second. Before next character (.080″) at 500 characters per second. Within 5 characters (.500″) at 1000 characters per second.

OUTPUTS:
Output polarities available are shown below. Outputs are clamped at 10 volts up to 5 milliamperes. Voltage levels will decrease if additional current is drawn. Timing pulse duration is 35 ±5 microseconds.

	Standard	Optional		
HOLE	−10V	+10V	0V	0V
NO HOLE	0V	0V	+10V	−10V
SPROCKET	−10V	+10V	0V	0V
TIMING PULSE	−10V	+10V	0V	0V

CONTROL LOGIC:
"START" 6 to 12 volt level or pulse. Minimum pulse width of 30 microseconds. Maximum pulse rise time of 2 microseconds.

"STOP" same as for "Start."

"FORWARD" (read or wind right) 6 to 12 volt level, 20 milliwatts maximum at 6 volts.

"REVERSE" (read or wind left) same as for "Forward."

"WIND/SEARCH" 6 to 12 volt level, 30 milliwatts maximum at 6 volts.

POWER REQUIREMENTS:
105 to 125 volts, single phase, 50-60 cps or 400 cps. Nominal power consumption is 350 watts.

TAPE COMPATIBILITY:
Paper, paper mylar or metalized mylar tapes with a maximum light transmission of 40% can be used. Tape can be 5, 6, 7 or 8 level, 11/16″, 7/8″ or 1″ wide.

TAPE STORAGE:
Eight inch NARTB reels provided with captive knobs and expansion reel holders. Reel capacity is:

1000 feet of tape .0025″ thick
650 feet of tape .0039″ thick
550 feet of tape .0046″ thick

REEL SERVO CONTROL:
Proportional reel servos vary the speed of the reel motors to meet the requirements of the capstan. Full servo control is maintained in the Wind/Search mode (1000 characters/second).

READ HEAD:
Code and sprocket hole outputs are provided by silicon solar cell photoelectric light sensors. The read head is protected against dirt build-up.

CODE HOLE AMPLIFIERS:
The code hole amplifiers are contained on plug-in printed circuit boards with individual gain controls for each channel.

CONNECTORS:
AC Input — 3 pin. Mating Connector MS3106A-14S-1S.
Control Input — 14 pin. Mating Connector MS3106A-20-27S.
Output — 10 pin. Mating Connector MS3106-A18-1P.

PROTECTIVE DEVICES:
Reel power supply — 8A fuse.

Reader power supply — 5A fuse.

No-Tape Switch — Reel and capstan drive become inoperative at end of reel or in case of tape breakage. A "No-Tape" signal is available in the Control Connector.

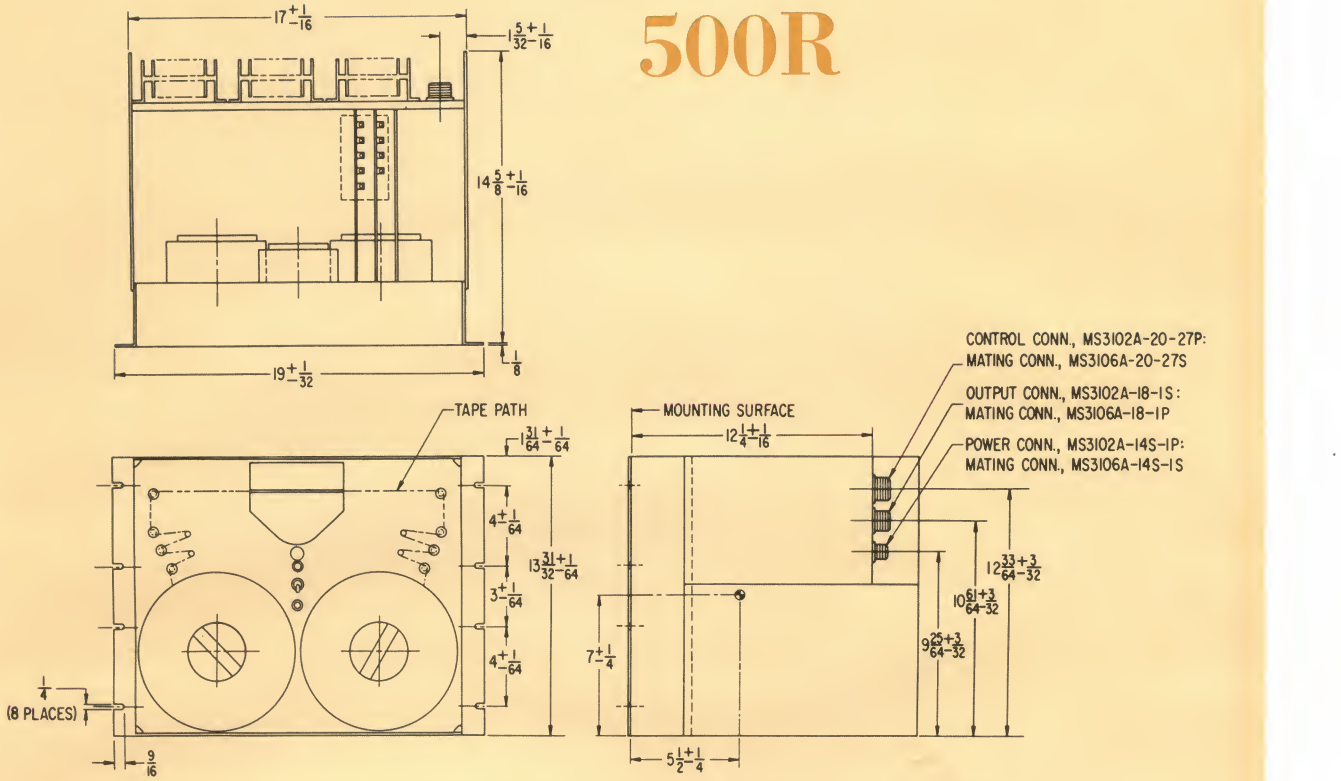
TEMPERATURE RANGE:
Operating temperature range 0° to 52°C. (32° to 125°F.).

DUTY CYCLE:
100% in any mode except maximum asynchronous rate. Duty cycle in this mode should be calculated by factory.

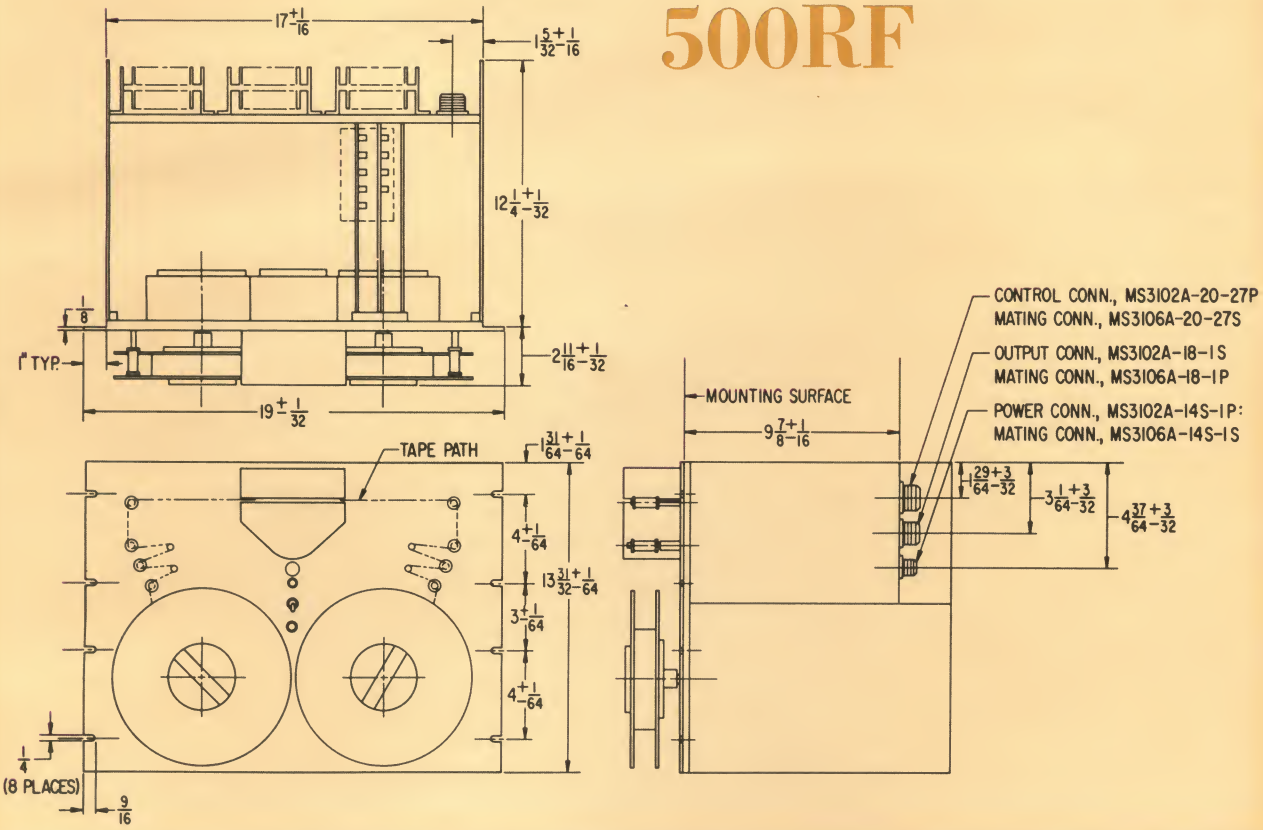
SERVICE LIFE:
10,000 hours, minimum life expectancy.

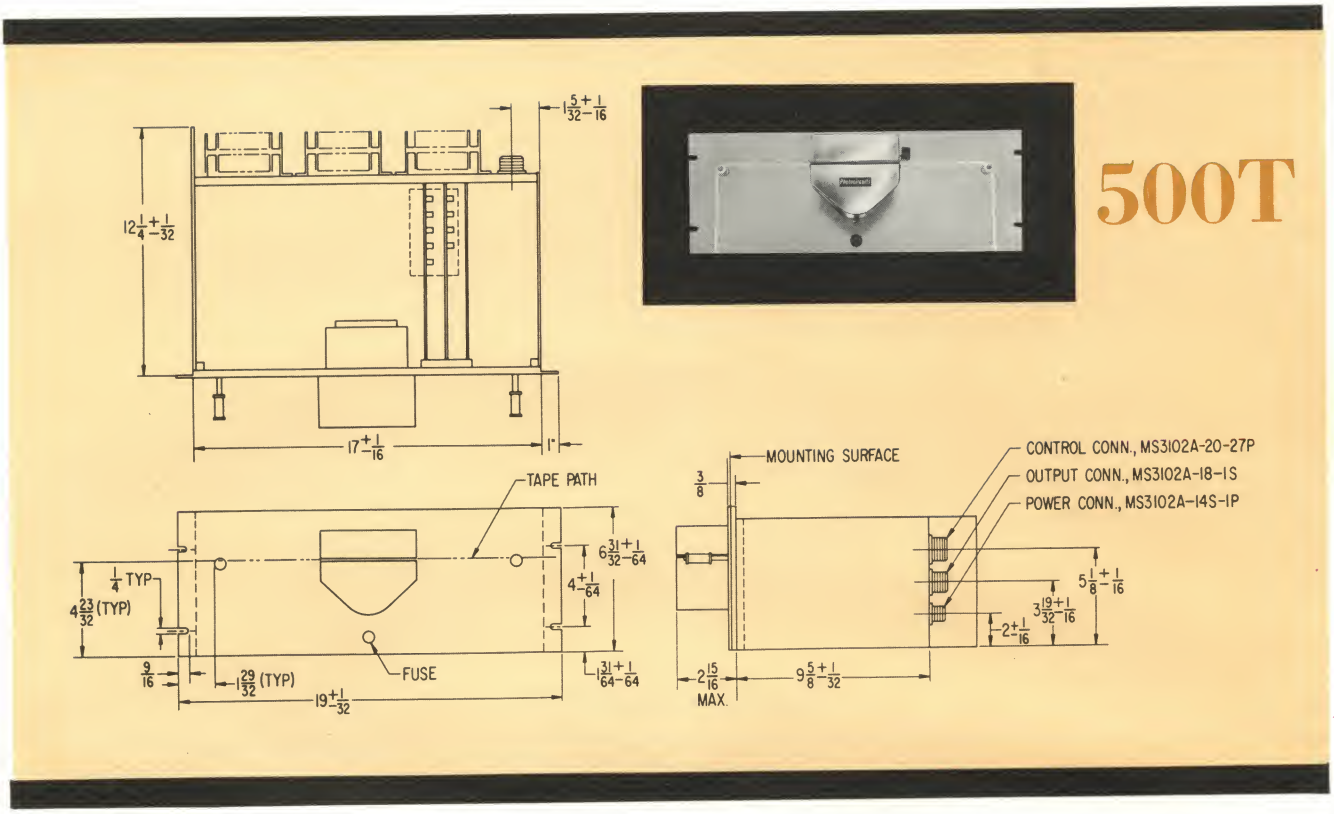
WEIGHT:
71 pounds.

500R


TAPE PATH
MOUNTING SURFACE
CONTROL CONN., MS3102A-20-27P:
MATING CONN., MS3106A-20-27S
OUTPUT CONN., MS3102A-18-1S:
MATING CONN., MS3106A-18-1P
POWER CONN., MS3102A-14S-1P:
MATING CONN., MS3106A-14S-1S
(8 PLACES)

500RF


1" TYP.
TAPE PATH
MOUNTING SURFACE
CONTROL CONN., MS3102A-20-27P
MATING CONN., MS3106A-20-27S
OUTPUT CONN., MS3102A-18-1S
MATING CONN., MS3106A-18-1P
POWER CONN., MS3102A-14S-1P:
MATING CONN., MS3106A-14S-1S
(8 PLACES)



500T

MODEL 500T SPECIFICATIONS

READING SPEED:
0 to 200 characters per second in the asynchronous (line-by-line) mode. Speed varies with the frequency of the start commands.

Up to 500 characters per second in the free-running (constant speed) mode. Reading speed may be set by screwdriver adjustment at any required level between 100 and 500 characters per second.

1000 characters per second nominal in the Wind/Search mode.

READER OPERATION:
Bi-directional in all modes. All functions remotely controlled.

START TIME:
3.5 milliseconds after start command to reach the next character.

STOP DISTANCE:
On stop character (.046″) at 200 characters per second. Before next character (.080″) at 500 characters per second. Within 5 characters (.500″) at 1000 characters per second.

OUTPUTS:
Output polarities available are shown below. Outputs are clamped at 10 volts up to 5 milliamperes. Voltage levels will decrease if additional current is drawn. Timing pulse duration is 35 ±5 microseconds.

	Standard		Optional	
HOLE	−10V	+10V	0V	0V
NO HOLE	0V	0V	+10V	−10V
SPROCKET	−10V	+10V	0V	0V
TIMING PULSE	−10V	+10V	0V	0V

CONTROL LOGIC:
"START" 6 to 12 volt level or pulse. Minimum pulse width of 30 microseconds. Maximum pulse rise time of 2 microseconds.

"STOP" Same as for "Start."

"FORWARD" (read or wind right) 6 to 12 volt level, 20 milliwatts maximum at 6 volts.

"REVERSE" (read or wind left) same as for "Forward."

"WIND/SEARCH" 6 to 12 volt level, 30 milliwatts maximum at 6 volts.

POWER REQUIREMENTS:
105 to 125 volts, single phase, 50-60 cps or 400 cps. Nominal power consumption is 175 watts.

TAPE COMPATIBILITY:
Paper, paper mylar or metalized mylar tapes with a maximum light transmission of 40% can be used. Tape can be 5, 6, 7 or 8 level, 11/16″, 7/8″ or 1″ wide.

READ HEAD:
Code and sprocket hole outputs are provided by silicon solar cell photoelectric sensors. The read head is protected against dirt build-up.

CODE HOLE AMPLIFIERS:
The code hole amplifiers are contained on plug-in printed circuit boards with individual gain controls for each channel.

CONNECTORS:
AC Input — 3 pin. Mating Connector MS3106A-14S-1S.
Control Input — 14 pin. Mating Connector MS3106A-20-27S.
Output — 10 pin. Mating Connector MS3106A-18-1P.

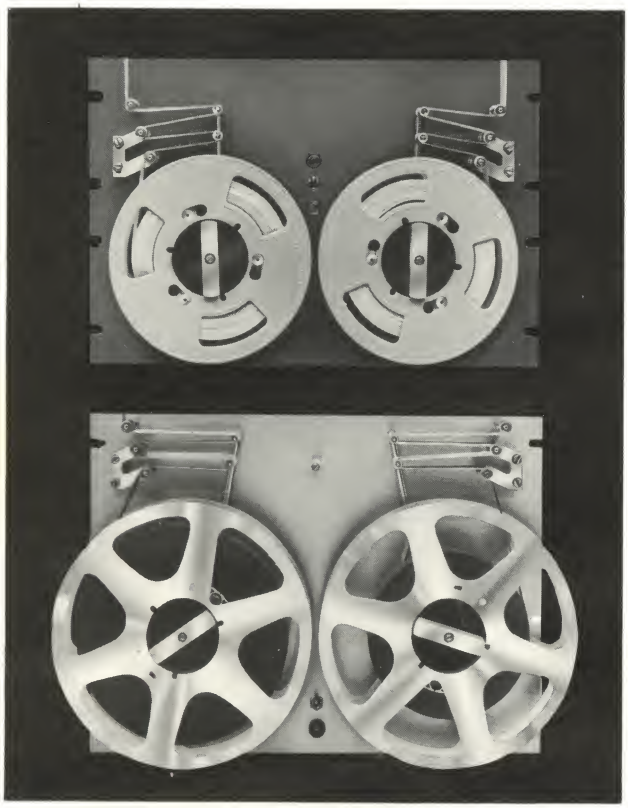
PROTECTIVE DEVICES:
Reader power supply protected by 5A fuse.

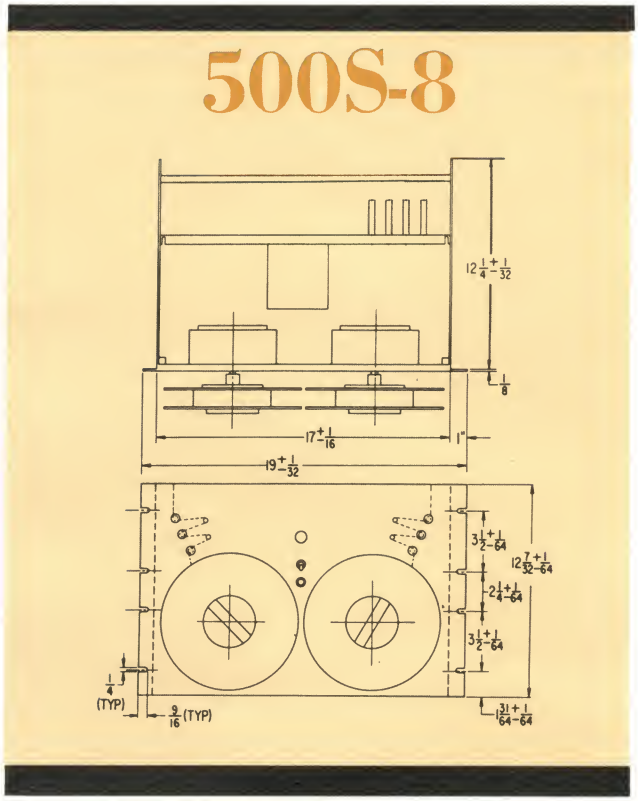
TEMPERATURE RANGE:
Operating temperature range 0° to 52°C. (32° to 125°F.).

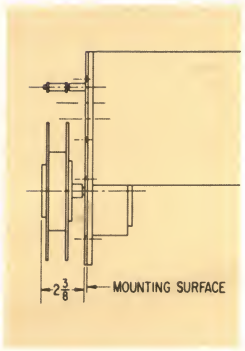
DUTY CYCLE:
100% in any operating mode except maximum asynchronous rate. Duty cycle in this mode should be calculated by factory.

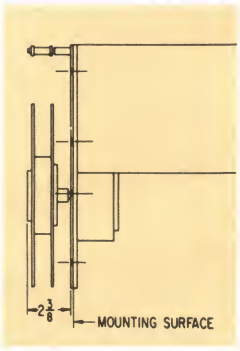
SERVICE LIFE:
10,000 hours, minimum life expectancy.

WEIGHT:
36 pounds.









MODEL 500S-8 & 500S-10 SPECIFICATIONS

TRANSPORT SPEED:
When used with Photocircuits Corporation reading units, both models supply tape as required by the capstan at any speed up to 100 inches per second. The factory should be contacted for use with other equipment.

TAPE STORAGE:
8" and 10½" NARTB reels provided with captive knobs and expansion reel holders have the following capacities:

500S-8	500S-10
1000′ of .0025" tape	2400′ of .0025" tape
650′ of .0039" tape	1500′ of .0039" tape
550′ of .0046" tape	1300′ of .0046" tape

REEL SERVO CONTROL:
Proportional reel servos vary the speed of the reel motors to meet the demands of the capstan. Servo control is maintained at all speeds.

PROTECTIVE DEVICES:
Fuse protects power supply. "No Tape" switch makes reel motors inoperative at end of reel or in case of tape breakage.

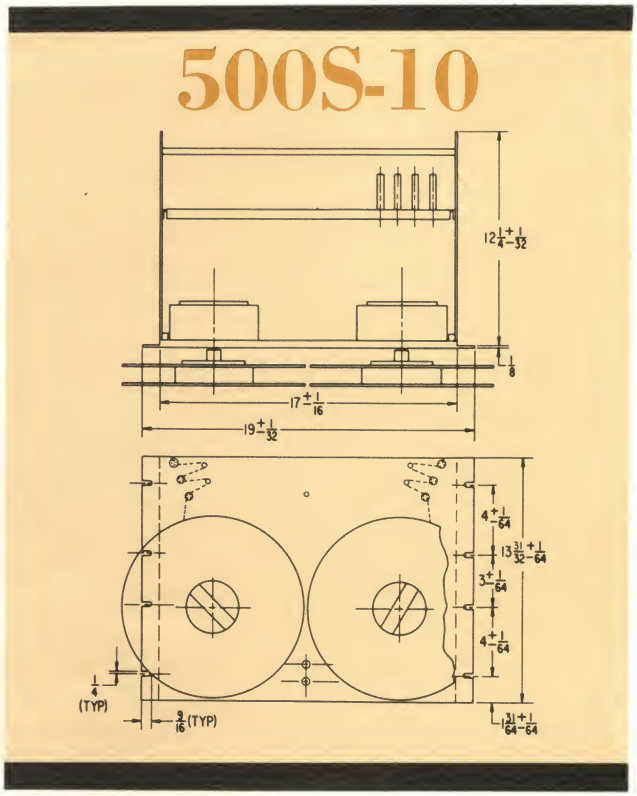
TEMPERATURE RANGE:
Operating temperature range 0° to 52°C. (32° to 125°F.).

POWER REQUIREMENTS:
105 to 125 volts, single phase, 50-60 or 400 cps. Nominal power consumption for the 500S-8 is 225 watts. Nominal power consumption for the 500S-10 is 250 watts.

DUTY CYCLE:
100%.

SERVICE LIFE:
10,000 hours, minimum life expectancy.

WEIGHT:
500S-8: 37 pounds.
500S-10: 55 pounds.



Printed in U.S.A. DB5M265

SPECIAL FEATURES of the 500 Series Tape Readers and Spoolers

- Printed Motor Direct Capstan Drive
- In-Line Loading
- Advanced Solid State Circuit Design
- Wide Aperture Read Head
- Proportional Reel Servo Control
- Twelve-Month Warranty

For further information write Data Processing Division

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